

Remarks

Claims 1-14 were pending in the subject application. By this Amendment, claim 1 has been amended, claims 2-5, 7, 8, and 12 have been canceled, and new claims 15-21 have been added. No new matter has been introduced. Support for the amendment to claim 1 and new claims 15-21 can be found throughout the original specification (see, for example; page 2, lines 1-2, 8-11, 18-19, and 29; and original claims 6, 9-11, 13, and 14). Upon entry of this Amendment, claims 1, 6, 9-11, and 13-21 will be before the Examiner for consideration.

The amendments to the claims have been made in an effort to lend greater clarity to the claimed subject matter and to expedite prosecution. The amendments should not be taken to indicate the applicants' agreement with, or acquiescence to, the rejections of record. Favorable consideration of the claims now presented, in view of the remarks and amendments set forth herein, is earnestly solicited.

Claim 7 has been rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Though claim 7 has been canceled, the applicants respectfully request reconsideration of this rejection as it might be applied to the claims currently presented. Independent claims 1 and 15 each recite that the hydrophilic membrane "is ionically inactive or weakly ionically active." This feature is described at, for example, page 2, lines 8 and 29 of the original specification. Also, the applicants submit that a skilled artisan would understand the meaning of the term "weakly ionically active" since there would be no point in adding an electrolyte if the membrane was more strongly ionically active.

Additionally, independent claims 1 and 15 each omit the term "ion-exchange" because the membrane is not intrinsically an ion-exchange membrane. However, the fact that it is hydrophilic, and that an electrolyte is added, means that it functions, in use, as an ion-exchange membrane.

The applicants submit that the claims particularly point out and distinctly claim the subject matter regarded as the invention. Accordingly, the applicants respectfully request reconsideration and withdrawal of the rejection under §112, second paragraph.

Claims 1-8 and 12-14 have been rejected under 35 U.S.C. §102(b) as being anticipated by Hilmer (U.S. Patent No. 3,492,163). The applicants respectfully traverse this ground for rejection because the cited reference does not disclose each element of the claimed invention.

Initially, the applicants wish to emphasize that the claimed method requires performing the electrochemical reaction in a cell including electrodes separated by a hydrophilic membrane. However, the electrolyte matrix **13** of Hilmer, cited in the Action as a membrane between two electrodes, is made up of fibrous asbestos and is plainly not hydrophilic.

Additionally, by this Amendment, claim 1 has been amended to recite that the concentration of the electrolyte “is controlled by removing water from the membrane” (emphasis added) and that the membrane is “ionically inactive or weakly ionically active.” On the other hand, Hilmer discloses water removal only from the electrolyte and fails to teach a membrane as in the claimed invention. Moreover, Hilmer requires infusion of the electrolyte, whereas the present invention does not.

The applicants also note that new claim 15 recites a method of performing an electrochemical reaction in which water is converted into hydrogen and oxygen. Hilmer fails to teach or disclose any such reaction of converting water into hydrogen and oxygen. Claim 15 also recites that the membrane is hydrophilic, yet another feature not suggested by Hilmer.

As the Examiner is aware, it is a basic premise of patent law that in order to anticipate, a single reference must disclose within the four corners of the document each and every element and limitation contained in the rejected claim. *Scripps Clinic & Research Foundation v. Genentech Inc.*, 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991). Hilmer fails to teach, or even suggest, several advantageous features of the subject invention. For example, there is no disclosure of a hydrophilic membrane separating electrodes or water removal from the membrane.

Accordingly, the applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §102(b) based on Hilmer.

Claims 9-11 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Hilmer as applied to claims 1-8 and 12-14 above, and further in view of Naito *et al.*, (U.S. Patent No. 3,925,332). The applicants respectfully traverse this ground for rejection because the cited references, taken either alone or combination, do not teach or suggest the claimed invention.

The deficiencies of Hilmer have been discussed above. Naito *et al.* do not cure, or even address, these deficiencies. For example, the combination of cited references fails to teach or suggest a hydrophilic membrane separating electrodes, or controlling the concentration of an

electrolyte by removing water from a membrane.

Moreover, Naito *et al.* require the presence of an ionic species as part of the membrane and do not require addition of electrolyte. Therefore, the applicants submit that a skilled artisan would not have had any reason to replace the membrane in Naito *et al.* (or Hilmer) by one which is ionically inactive or weakly ionically active, as required by the claimed invention. In fact, Naito *et al.* effectively teach away from such a membrane by requiring an ionic species as part of the membrane.

As discussed above, the combination of Hilmer and Naito *et al.* fails to teach or suggest several elements of the claimed invention. Accordingly, the applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a) based on Hilmer in view of Naito *et al.*

In view of the foregoing remarks, the applicants believe that the currently pending claims are in condition for allowance, and such action is respectfully requested.

The Commissioner is hereby authorized to charge any fees under 37 CFR §§1.16 or 1.17 as required by this paper to Deposit Account No. 19-0065.

The applicants also invite the Examiner to call the undersigned if clarification is needed on any of this response, or if the Examiner believes a telephone interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,



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